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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/652,482

09/02/2003

Tomohiro Sakai

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EXAMINER

MASKULINSKI, MICHAEL C

ART UNIT

PAPER NUMBER

2113

DATE MAILED: 08/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/652,482

Applicant(s)

SAKAI, TOMOHIRO

Examiner

Michael C. Maskulinski

Art Unit

2113

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 18-27 is/are rejected.
- 7) ☒ Claim(s) 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 9/2/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**Non-Final Office Action**

***Claim Rejections - 35 USC § 101***

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 8 and 27 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 8 and 27 claim a recording medium on which a program is stored and variations thereof. These claims therefore are interpreted as recording a program per se. In order to overcome this rejection, language, specifically stating the claim, must be limited to a computer program stored on a computer recordable medium executing on a computer.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4. Claims 2-5, 7, 10, 12, 14, 15, 18, and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors. These errors appear as follows:

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Referring to claim 2, in line 5, "informing the routes each other that the receptions".

Referring to claim 3, in lines 3-4, "by accessing from a route, in which all of the devices were detached from the loop interface so that the loop abnormality has been resolved, to another route".

Referring to claim 4, in line 8, "including a loop diagnosis by the performing the loop diagnosis".

Referring to claim 5, in line 2, "the certain period of time is so set as a little longer".

Referring to claim 7, in lines 2-3, "accessing to disk controlling means".

Referring to claim 10, in lines 5-6, "receiving data each other between the disk controlling means".

Referring to claim 12, in line 3, "by accessing to disk controlling means".

Referring to claim 14, in line 3, "accessing to disk controlling means".

Referring to claim 15, in line 5, "receiving data each other between the loop".

Referring to claim 18, in line 2, "the certain period of time is so set as a little longer".

6. Claim 23 recites the limitation "the second service means" in line 2. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 18 recites the limitation "the certain period of time" in line 2. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination, the Examiner will assume that claim 18 is dependent on claim 17.

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8. The following is a quotation of the fourth paragraph of 35 U.S.C. 112:

Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

9. Claim 27 is rejected under 35 U.S.C. 112, fourth paragraph, as being an improper dependent claim. It is unclear as to what the Applicant is attempting to claim since the claim fails to further limit claim 15. Claim 27 appears to be independent claims and should be written as such.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-3, 6-16, and 19-27 are rejected under 35 U.S.C. 102(e) as being anticipated by El-Batal, US 2004/0153914 A1.

Referring to claim 1:

- a. In paragraph 0025, El-Batal discloses that either storage controller detects a failure in a loop (detecting per route that abnormalities occur in all loop interfaces which are multiplexed and to which devices are connected).
- b. In paragraph 0025, El-Batal discloses that the storage controller enables the port bypass circuits for all device drivers on the failed loop (when the

abnormalities in the loop interfaces are detected, detaching all devices connected to at least one of the loop interfaces).

Referring to claim 2:

a. In paragraph 0025, El-Batal discloses that the storage controller detected the failure because a LIP signal injected into the switch did not return to the storage controller (detecting that receptions of commands have ceased, which commands are regularly transmitted through the loop interfaces to which the devices are connected).

b. In paragraph 0025, El-Batal discloses that next, the storage controller records an indication that the loop is down and that all device access commands for all disk drives should be handled through the other loop (informing the routes each other that the receptions of the commands have ceased, and when detecting that receptions of the commands have ceased in all routes, detecting that abnormalities occur in all of the loop interfaces).

Referring to claim 3, in paragraph 0025, El-Batal discloses both storage controllers determine whether loop 24 is up. This will be the case if the problem is one of the storage devices in loop 24. Next, storage controller 20 disables the port bypass circuit of each of the switches in loop 24, one at a time, enabling all the other port bypass circuits. For each disabling of the port bypass circuit for a switch in loop 24, storage controller 20 determines if loop 24 is "up" by injecting the LIP signal into one end of the, loop and checking for it to return from the other end of the loop. If so, this indicates that the non-bypassed switch and associated storage device are good. If not,

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this indicates that the non-bypassed switch or associated storage device (such as switch 73 and device D13) is bad, and storage controller 20 "permanently" enables the port bypass circuit for this switch and associated storage device (further comprising a step of performing a loop diagnosis for identifying a faulty device by accessing from a route, in which all of the devices were detached from the loop interface so that the loop abnormality has been resolved, to another route).

Referring to claim 6, in paragraph 0025, El-Batal discloses that if the non-bypassed switch or associated storage device (such as switch 73 and device D13) is bad, storage controller 20 "permanently" enables the port bypass circuit for this switch and associated storage device (wherein a device determined as faulty in the loop diagnosis is detached from the loop interface, and the loop interface is to be in use again).

Referring to claim 7, in paragraph 0025, El-Batal discloses both storage controllers determine whether loop 24 is up. This will be the case if the problem is one of the storage devices in loop 24. Next, storage controller 20 disables the port bypass circuit of each of the switches in loop 24, one at a time, enabling all the other port bypass circuits. For each disabling of the port bypass circuit for a switch in loop 24, storage controller 20 determines if loop 24 is "up" by injecting the LIP signal into one end of the, loop and checking for it to return from the other end of the loop. If so, this indicates that the non-bypassed switch and associated storage device are good. If not, this indicates that the non-bypassed switch or associated storage device (such as switch 73 and device D13) is bad, and storage controller 20 "permanently" enables the

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port bypass circuit for this switch and associated storage device (wherein the loop diagnosis for identifying a faulty device is performed by accessing to disk controlling means connected to another loop interface via the disk controlling means connected to the loop interface which is in use again).

Referring to claim 8, in paragraph 0009, El-Batal discloses a program embodied in electrical signals, said program enabling a computer to execute each step as claimed in claim 1.

Referring to claim 9, in paragraph 0009, El-Batal discloses a computer-readable storage medium recording thereon a program which causes a computer to perform said steps of claim 1.

Referring to claim 10:

- a. In paragraph 0016, El-Batal discloses that each loop comprises a series of switches, one switch for each device driver (loop connection switching means for connecting and detaching devices to and from multiplexed loop interfaces).
- b. In paragraph 0016, El-Batal discloses that each storage controller interfaces to both series of switches in both loops to provide redundancy (disk controlling means for controlling the loop connection switching means and a first interface for transmitting and receiving data each other between the disk controlling means).
- c. In paragraph 0025, El-Batal discloses that the storage controller enables the port bypass circuits for all device drivers on the failed loop (wherein the disk controlling means have, when detecting that abnormalities occur in all of the loop



interfaces, functions of outputting to the loop connection switching means instructions to detach all devices connected to at least one of the loop interfaces).

Referring to claim 11, in paragraph 0025, El-Batal discloses that either storage controller detects a failure in a loop, for example, storage controller 20 detects a failure in loop 24. The storage controller detected the failure because a LIP signal injected into switch 60 did not return to the storage controller. Next, storage controller 20 records an indication that loop 24 is down, and that all device access commands for all disk drives, should be handled through loop 25. Storage controller 20 notifies storage controller 21 that loop 24 is down and to failover to loop 25 (wherein the disk controlling means, when detecting that receptions of commands have ceased, which commands are regularly transmitted through loop interfaces to which devices managed by the disk controlling means are connected, inform via the first interface to another disk controlling means that the receptions of the commands have ceased, and when detecting that receptions of commands have ceased in all disk controlling means, detect that abnormalities occur in all of the loop interfaces).

Referring to claim 12, in paragraph 0025, El-Batal discloses both storage controllers determine whether loop 24 is up. This will be the case if the problem is one of the storage devices in loop 24. Next, storage controller 20 disables the port bypass circuit of each of the switches in loop 24, one at a time, enabling all the other port bypass circuits. For each disabling of the port bypass circuit for a switch in loop 24, storage controller 20 determines if loop 24 is "up" by injecting the LIP signal into one

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end of the, loop and checking for it to return from the other end of the loop. If so, this indicates that the non-bypassed switch and associated storage device are good. If not, this indicates that the non-bypassed switch or associated storage device (such as switch 73 and device D13) is bad, and storage controller 20 "permanently" enables the port bypass circuit for this switch and associated storage device (wherein the disk controlling means includes loop diagnostic means for performing a loop diagnosis to identify a faulty device by accessing to disk controlling means connected to another loop interface via the disk controlling means connected to the loop interface in which all connected devices were detached so that the loop abnormality has been resolved).

Referring to claim 13, in paragraph 0025, El-Batal discloses that if the non-bypassed switch or associated storage device (such as switch 73 and device D13) is bad, and storage controller 20 "permanently" enables the port bypass circuit for this switch and associated storage device (wherein the loop diagnostic means detaches a device determined as faulty in the loop diagnosis from the loop interface so as to allow the loop interface to be in use again).

Referring to claim 14, in paragraph 0025, El-Batal discloses both storage controllers determine whether loop 24 is up. This will be the case if the problem is one of the storage devices in loop 24. Next, storage controller 20 disables the port bypass circuit of each of the switches in loop 24, one at a time, enabling all the other port bypass circuits. For each disabling of the port bypass circuit for a switch in loop 24, storage controller 20 determines if loop 24 is "up" by injecting the LIP signal into one end of the, loop and checking for it to return from the other end of the loop. If so, this

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indicates that the non-bypassed switch and associated storage device are good. If not, this indicates that the non-bypassed switch or associated storage device (such as switch 73 and device D13) is bad, and storage controller 20 "permanently" enables the port bypass circuit for this switch and associated storage device (wherein the loop diagnostic means performs the loop diagnosis for identifying a faulty device by accessing to disk controlling means connected to another loop interface via the disk controlling means connected to the loop interface which is in use again).

Referring to claim 15:

- a. In paragraph 0004, EI-Batal discloses an enclosure services interface processor associated with the daisy-chain of switches and storage controllers (enclosure service means which connects to the disk controlling means and to the devices through one loop interface of the multiplexed loop interfaces).
- b. In paragraph 0011, EI-Batal discloses a plurality of small form factor ports between the two daisy-chains (a second interface for transmitting and receiving data each other between the loop interface and another loop interface).
- c. In paragraph 0019, EI-Batal discloses that when either storage controller wants to communicate with ESI processor 82 to control a switch it does so through loop 25 and ESI processor 74 (wherein the enclosure service means communicates with other enclosure service means). In paragraph 0025, EI-Batal discloses that storage controller 10 enables the port bypass circuits for all device drivers on loop 24 via loop 11, ESI processor 74, ESI multiplexing circuit 80 and ESI processor 82 (controls the loop connection switching means when

abnormalities are detected in all of the loop interfaces so as to detach all devices connected to the loop interface).

Referring to claim 16, in paragraph 0025, El-Batal discloses that the storage controller detected the failure because a LIP signal injected into the switch did not return to the storage controller. Next, storage controller 20 records an indication that loop 24 is down, and that all device access commands for all disk drives, should be handled through loop 25. Storage controller 20 notifies storage controller 21 that loop 24 is down and to failover to loop 25. Next, storage controller 10 enables the port bypass circuits for all device drivers on loop 24 via loop 11, ESI processor 74, ESI multiplexing circuit 80 and ESI processor 82 as described above (wherein the enclosure service means includes, when detecting that a reception of commands has ceased, which commands are regularly transmitted through a loop interface to which devices managed by the enclosure service means are connected, means for informing via the second interface to another enclosure service means that the reception of commands has ceased, and when detected that receptions of commands have ceased in all of the enclosure service means, detects that abnormalities occur in all of the loop interfaces).

Referring to claim 19, in paragraph 0003, El-Batal discloses that the loop interface comprises a Fibre Channel Arbitrated Loop (FC-AL).

Referring to claim 20, in paragraph 0018, El-Batal discloses that the devices comprises hard disk devices.

Referring to claim 21, in paragraph 0025, El-Batal discloses that either storage controller detects a failure in a loop (wherein the disk controlling means monitors abnormalities in a plurality of loop interfaces).

Referring to claim 22, in paragraph 0023, El-Batal discloses that the enclosure service means monitors abnormalities in a plurality of loop interfaces.

Referring to claim 23, in Figure 1, El-Batal discloses a disk unit device, comprising the enclosure service means (ESI), the second interface means (SFP), the loop connection switching means and the devices (D0-D14), claimed in claim 15, which are detached from the disk controlling means to thereby form an independent disk unit means (see reference number 43 for all three means and devices).

Referring to claim 24, in paragraph 0025, El-Batal discloses that the storage controller detected the failure because a LIP signal injected into the switch did not return to the storage controller. Next, storage controller 20 records an indication that loop 24 is down, and that all device access commands for all disk drives, should be handled through loop 25. Storage controller 20 notifies storage controller 21 that loop 24 is down and to failover to loop 25. Next, storage controller 10 enables the port bypass circuits for all device drivers on loop 24 via loop 11, ESI processor 74, ESI multiplexing circuit 80 and ESI processor 82 as described above (wherein the enclosure service means includes, when detecting that a reception of commands has ceased, which commands are regularly transmitted through a loop interface to which devices managed by the enclosure service means are connected, means for informing via the second interface to another enclosure service means that the reception of commands has ceased, and

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when detected that receptions of commands have ceased in all of the enclosure service means, detects that abnormalities occur in all of the loop interfaces).

Referring to claim 25, in paragraph 0003, El-Batal discloses that the loop interface comprises a Fibre Channel Arbitrated Loop (FC-AL).

Referring to claim 26, in paragraph 0018, El-Batal discloses that the devices comprises hard disk devices.

Referring to claim 27, in paragraph 0009, El-Batal discloses a program for letting a computer execute each means as claimed in claim 23.

***Allowable Subject Matter***

12. Claim 17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. Claims 4, 5, and 18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter.

Referring to claim 4, the prior art does not teach or reasonably suggest when the loop abnormalities were resolved in the certain period of time, inquiring disk controlling means whether they detached all of the devices, and when all of the devices were detached by the disk controlling means, performing countermeasure processing against

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a double-route link failure including a loop diagnosis by the step of performing the loop diagnosis.

Referring to claim 17, the prior art does not teach or reasonably suggest when the loop abnormalities were resolved in the certain period of time, inquire the disk controlling means whether they detached all of the devices, and when all of the devices were detached by the controlling device, perform countermeasure processing against a double-route link failure including a loop diagnosis.

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited prior art is related to detecting failures in fiber channel loops and means for resolving the failures.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Maskulinski whose telephone number is (571) 272-3649. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert W. Beausoliel can be reached on (571) 272-3645. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Michael C Maskulinski  
Examiner  
Art Unit 2113